Remarks

Claims 1 and 11 are amended. Claims 1 to 11 are pending in this application of which only claims 1 and 11 are in independent form.

Claim 1 was rejected under 35 USC 102(b) as being anticipated by Linderholm. The following will show that claim 1, as amended, patentably distinguishes the applicant's invention over this reference.

The applicant's invention proceeds from the state of the art set forth in the introduction of the applicant's disclosure wherein a driveable work tool at the free end of a work tool holder is introduced into the cylinder for forming the control windows in the cylinder wall of a cylinder housing of an internal combustion engine, and via a transverse movement relative to the rotational axis of the tool holder, is brought into engagement with the cylinder wall. This state of the art described by the applicant is also set forth in the newly cited Japanese reference JP-58-155114 (please see FIGS. 1 and 2) and United States patent publication US 2005/0166396 A1 (Brockel et al) (see FIGS. 3 and 4). Both publications disclose arrangements wherein a rotatable milling head is introduced into the interior of a cylinder and a machining of the cylinder wall takes place for forming a control window via transverse movement of the tool holder. The rotational axis of the tool holder is coincident with the drive axis of the mounted work tool for every conceivable operating position.

In contrast to this state of the art, the applicant's invention distinguishes itself by an arrangement of the work tool on the work tool holder wherein the drive axis of the work tool is orthogonal to the rotational axis of the work tool holder.

Accordingly, the newly cited references lie still farther away from the applicant's invention and show only special configurations of a cutting tool

The orthogonal arrangement of the cutting tool ensures a high precision of the machining operation when cutting out the control window and permits a desired angular configuration of the edge of the control window. This is precluded by the known cutter units because they can only be brought into contact engagement with the workpiece at the periphery of the cutting head.

The applicant respectfully submits that Linderholm discloses no arrangement of the cutting tool with a drive axis or rotational axis lying orthogonally to the rotational axis of the tool holder. The Examiner is correct in that Linderholm goes beyond the other applied references insofar as the rotational axis of the tool holder of Linderholm is not perforce coincident with the drive axis of the cutting tool.

In the known arrangement, an adjusting device is provided with which the cutting tool can be displaced eccentrically. In each possible position, however, and in contrast to the applicant's invention, the rotational axis of the cutting tool always lies parallel to the rotational axis of the tool holder. According to the view expressed in the action, in the case of an eccentric position of the tool axis in Linderholm, the work tool

carries out a circular movement about the holder axis and therefore moves in a plane perpendicular to the plane of the drawings as noted on page 7 of the action.

The applicant respectfully submits that this conclusion is based on an error because the axis, which moves eccentrically on a circular path, describes a rotational body about the axis of the tool holder. The applicant notes that a rotational movement of a line excludes a straight line movement of the axis in a plane. The axis of the circularly moving work tool of Linderholm therefore does not move orthogonally to the axis of the work tool holder; instead, it moves about this axis in a peripheral direction always at the same radial distance. Accordingly, this axis always lies parallel to the axis of the work tool holder.

It is indeed correct that in the arrangement of Linderholm, and for eccentrically displaced tool axis, a circular movement about the axis of the work tool holder is superposed on the work movement of the work tool. It is precisely because of this circular work movement in Linderholm that cutouts for attachment bolts are bored with greater dimensions than the work tool diameter for thin and corrugated composite materials (see column 1, starting at line 10). However, in this, no work movement takes place about a drive axis which lies <u>orthogonally</u> to the work tool axis as in the applicant's invention and as set forth in applicant's claim 1:

> "a driveable cutting tool mounted on said tool holder at said free end thereof and having a drive axis lying essentially <u>orthogonally</u> to said rotational axis;" (emphasis added)

It cannot be seriously doubted that with the term "drive

axis" generally the center of a rotational movement is defined. The term "drive axis" therefore describes clearly the axis at the center of the rotational work movement of the cutting tool.

The two axes of the superposed rotational movement of the bore work tool of Linderholm lie parallel. Even in accordance with the terminology of Linderholm, the description there is of a parallel position of the axis of the work tool holder (principal axis 54) and the drive axis of the work tool (tool axis 26). The first and second rotational axes are in column 3, starting at line 36, of this reference.

In the applicant's arrangement, the work tool is clearly arranged so that the drive axis of the work tool (that is, the axis about which the work movement of the cutting tool takes place) is orthogonal to the rotational axis of the work tool holder which is likewise rotationally moveable as clearly set forth in claim 1 with the clause:

> "a tool holder having a free end and defining a rotational axis about which said tool holder can be rotated;" (emphasis added)

The above is clearly not the case in Linderholm.

For a better understanding of the applicant's invention, applicant notes that the tool holder functions only to position the work tool and not to drive the work tool. Precisely this situation that the work movement of the cutting tool of the applicant's invention is not perforce determined by a rotational movement of the work tool holder ensures a high precision of the machining operation when manufacturing the control window in an engine cylinder and permits a desired angular configuration of

the edge of the control window to be made. This is not possible with the cutting tool of the state of the art.

The applicant especially disagrees with the conclusion advanced in the action that the teaching of Linderholm would not negate a use of the arrangement thereof to form control windows in a cylinder as set forth on page 9 of the action. Applicant respectfully asks what relevance the parallellity of the axes in Linderholm have for the possibility of a radial machining of the cylinder wall.

The Examiner confirms that the configuration of control windows are not suggested in this reference. Furthermore, it cannot be seriously doubted that the arrangement of Linderholm is provided to bore holes and not to machine a radial cylinder wall. Machining in a radial direction is considered but, for this purpose, the periphery of the work tool is utilized whose drive axis lies parallel to the main axis. In a hypothetical use in the area of application of the invention, namely, the machining of control windows, the drilling work tool could not come into contact with the cylinder wall in an eccentric position of the parallel axes because the chuck 20, which is always necessary, would not permit the work tool to come so close. In view of the above, applicant confirms that the arrangement of Linderholm with a work tool axis, which lies parallel to the main axis, is constructively precluded from machining cylinder walls.

In view of the foregoing, applicant submits that a person of ordinary skill would not seek out Linderholm to find a solution for machining control windows in the wall of a cylinder housing.

Applicant has shown how the driveable cutting tool of the

applicant's invention is arranged to the work tool holder and this is different from the arrangement of Linderholm. The cutting tool is expressly defined in claim 1 as having a drive axis lying orthogonally to the axis of the tool holder and no suggestion for this configuration is provided in Linderholm.

For the reasons advanced above, applicant submits that claim 1 patentably distinguishes his invention from Linderholm and should now be allowable as should claim 11 which essentially parallels claim 1.

Reconsideration of this application is earnestly solicited.

Respectfully submitted,

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